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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/871,086	05/31/2001	Ari P. Heikkinen	456-010392-US(PAR)	9314
2512	7590	09/30/2004	EXAMINER	
PERMAN & GREEN 425 POST ROAD FAIRFIELD, CT 06824			VO, HUYEN X	
			ART UNIT	PAPER NUMBER
			2655	

DATE MAILED: 09/30/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	09/871,086	HEIKKINEN, ARI P.	
	Examiner	Art Unit	
	Huyen Vo	2655	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 22 July 2004.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-18 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-18 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 31 May 2001 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|---|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Response to Amendment

1. In response to the office action from 4/20/2004, the applicant has submitted an amendment, filed 7/22/2004, amending claims 1, 8, 12, and 15, while arguing to traverse the art rejection based on the amended limitation regarding a "*determining at least one voicing parameter based on the modified signal*" and "*deciding the encoding method based on at least one determined voicing parameter*" (see amended claims).

Applicant's arguments have been considered but are moot in view of the new grounds of rejection, necessitated by the amended claims.

Claim Rejections - 35 USC § 103

2. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

3. Claims 1-2 and 8-14 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kleijn et al. (US Patent No. 6223151) in view of Griffin (IEEE Publication).

4. Regarding claims 1 and 8, Kleijn et al. disclose a method of encoding speech and an apparatus for generating a modified signal suitable for use with a speech encoder/decoder comprising the steps of:

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formulating a speech signal from utterances spoken by a speaker (input speech 120 is in the form of discrete samples, which are processed by elements 130 and 140 of figure 1); determining an estimate of periodicity from the formulated signal (col. 4, ln. 66 to col. 5, ln. 5); modifying the formulated signal using the periodicity estimate such that the periodicity is improved (col. 7, ln. 1 to col. 8, ln. 43 or referring to elements 190, 200, and 210 of figure 1); and encoding the modified signal in a speech encoder (Speech Coder 110 of fig. 1).

Kleijn et al. fail to disclose the steps of determining at least one voicing parameter based on the modified signal; and deciding the encoding method based on at least one determined voicing parameter. However, Griffin teach the steps of determining at least one voicing parameter based on the modified signal (*Section III-C on pages 1228-1229, determining whether the signal is a V/UV portions*); and deciding the encoding method based on at least one determined voicing parameter (*Sections V-A, based on the V/UN decision, different coding bits are assigned to the signal*); and

Since Kleijn et al. and Griffin are analogous art because they are from the same field of endeavors, it would have been obvious to one of ordinary skill in the art at the time of invention to modify Kleijn et al. by incorporating the teaching of Griffin in order to enhance the sign quality by assigning more bits to voiced portions and lesser bits to unvoiced portions.

5. Regarding claim 12, Kleijn et al. disclose a mobile device (col. 1, ln. 14-17) comprising:

a speech coder (element 110 of figure 1); means for formulating a speech signal from utterances spoken by a speaker (input speech 120 is in the form of discrete samples, which are processed by elements 130 and 140 of figure 1); means for determining an estimate of periodicity from the formulated signal (col. 4, ln. 66 to col. 5, ln. 5); means for modifying the formulated signal using the periodicity estimate such that the periodicity is improved (col. 7, ln. 1 to col. 8, ln. 43 or referring to elements 190, 200, and 210 of figure 1); and means for encoding the modified signal in the speech coder (Speech Coder 110 of figure 1).

Kleijn et al. fail to disclose the steps of determining at least one voicing parameter based on the modified signal; and deciding the encoding method based on at least one determined voicing parameter. However, Griffin teach the steps of determining at least one voicing parameter based on the modified signal (*Section III-C on pages 1228-1229, determining whether the signal is a V/UV portions*); and deciding the encoding method based on at least one determined voicing parameter (*Sections V-A, based on the V/UN decision, different coding bits are assigned to the signal*); and

Since Kleijn et al. and Griffin are analogous art because they are from the same field of endeavors, it would have been obvious to one of ordinary skill in the art at the time of invention to modify Kleijn et al. by incorporating the teaching of Griffin in order to enhance the sign quality by assigning more bits to voiced portions and lesser bits to unvoiced portions.

6. Regarding claim 2, Kleijn et al. further disclose that the formulated speech signal is a digitized signal such as a residual signal produced from a coding algorithm such as Linear Predictive Coding (LPC) or the actual speech signal itself (input speech 120 is inherently in the form of discrete samples required for processing by processors 130 and 140 of figure 1).

7. Regarding claims 9 and 13, Kleijn et al. further disclose that the formulating means includes software operating with a signal processor that is capable of generating a residual signal from a speech signal (col. 4, ln. 51-65, the residual processor 160 inherently includes software programs for generating linear-prediction residual).

8. Regarding claims 10 and 14, Kleijn et al. further disclose a memory comprising a software operating with a signal processor for providing means for transforming (elements 130 and 140 of figure 1), estimating (col. 4, ln. 66 to col. 5, ln. 5, processor inherently includes memory for storing software instructions), and modifying the speech signal (processors 190, 200, and 210 of figure 1).

9. Regarding claim 11, Kleijn et al. further disclose that the apparatus is integrated into a mobile device (col. 1, ln. 7-20).

10. Claims 3-5 and 7 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kleijn et al. (US Patent No. 6223151) in view of Griffin (IEEE Publication), as applied to claim 1, and further in view of Kleijn (US Patent No. 5517595).

11. Regarding claim 3, the modified Kleijn et al. fail to disclose that determining an estimate of periodicity step comprises obtaining a normalized pitch cycle by autocorrelation. However, Kleijn teaches that determining an estimate of periodicity step comprises obtaining a normalized pitch cycle by autocorrelation (col. 7, ln. 41-50). The advantage of using the teaching of Kleijn in Kleijn et al. is to select the pitch period proper for a certain point in time.

Since the modified Kleijn et al. and Kleijn are analogous art because they are from the same field of endeavors, it would have been obvious to one of ordinary skill in the art at the time of invention to further modify Kleijn et al. by incorporating the teaching of Kleijn in order to select the pitch period proper for a certain point in time.

12. Regarding claim 4, Kleijn et al. further disclose that the modifying step includes normalizing the pitch by shifting the time domain discrete values of the residual signal to conform to the normalized pitch cycle (col. 7, ln. 59-67).

13. Regarding claim 5, Kleijn et al. further disclose that the modifying step further comprises the speech signal being upsampled by interpolation such that suitable discrete values of the upsampled signal are shifted to conform to the average pitch cycle (Interpolator 140 of figure 1).

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14. Regarding claim 7, the modified Kleijn et al. fail to disclose that the modified signal is down sampled prior to encoding in the speech coder. However, Kleijn further teaches that the modified signal is down sampled prior to encoding in the speech coder (col. 11, ln. 25-35). The advantage of using the teaching of Kleijn in the modified Kleijn et al. is to lower bandwidth for the gain below the extraction frequency of the prototype waveform to minimize coding errors.

Since the modified Kleijn et al. and Kleijn are analogous art because they are from the same field of endeavors, it would have been obvious to one of ordinary skill in the art at the time of invention to further modify Kleijn et al. by incorporating the teaching of Kleijn in order to lower bandwidth for the gain below the extraction frequency of the prototype waveform to minimize coding errors.

15. Claims 15-18 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kleijn et al. (US Patent No. 6223151) in view of Griffin et al. (IEEE Publication), and further in view of Kleijn (US Patent No. 5517595).

16. Regarding claim 15, Kleijn et al. disclose a network element (col. 1, ln.7-17) comprising:

means for formulating a speech signal from utterances spoken by a speaker (input speech 120 is in the form of discrete samples, which are processed by elements 130 and 140 of figure 1); means for determining an estimate of periodicity from the formulated signal (col. 4, ln. 66 to col. 5, ln. 5); means for modifying the formulated

signal using the periodicity estimate such that the periodicity is improved (col. 7, ln. 1 to col. 8, ln. 43 or referring to elements 190, 200, and 210 of figure 1); and means for encoding speech signals using the modified signal (Speech Coder 110 of figure 1).

Kleijn et al. fail to disclose a means for determining at least one voicing parameter based on the modified signal; a mean for deciding the encoding method based on at least one determined voicing parameter; and means for decoding speech signals using the modified signal. However, Griffin et al. teach a means for determining at least one voicing parameter based on the modified signal (*Section III-C on pages 1228-1229, determining whether the signal is a V/UV portions*); and a mean for deciding the encoding method based on at least one determined voicing parameter (*Sections V-A, based on the V/UN decision, different coding bits are assigned to the signal*).

Since Kleijn et al. and Griffin et al. are analogous art because they are from the same field of endeavors, it would have been obvious to one of ordinary skill in the art at the time of invention to modify Kleijn et al. by incorporating the teaching of Griffin in order to enhance speech quality by assigning more code bits to the voiced portions of the signal than un-voiced portions.

The modified Kleijn (6223151) still fails to disclose means for decoding speech signals using the modified signal. However, Kleijn (5517595) teaches means for decoding speech signals using the modified signal (figure 9 or col. 3, ln. 44-45). The advantage of using the teaching of Kleijn in Kleijn et al. is to enable the network to reconstruct the original signal for users.

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Since the modified Kleijn et al. and Kleijn are analogous art because they are from the same field of endeavors, it would have been obvious to one of ordinary skill in the art at the time of invention to further modify Kleijn et al. by incorporating the teaching of Kleijn in order to enable the network to reconstruct the original signal for users.

17. Regarding claim 16, Kleijn et al. further disclose that a network element integrated into a radio base station functioning within a wireless telecommunication network (col. 1, ln. 7-17).

18. Regarding claim 17, Kleijn et al. further disclose that the formulating means includes software operating with a signal processor that is capable of generating a residual signal from a speech signal (col. 4, ln. 51-65, the residual processor 160 inherently includes software programs for generating linear-prediction residual).

19. Regarding claim 18, Kleijn et al. further disclose a memory comprising a software operating with a signal processor for providing means for transforming (elements 130 and 140 of figure 1), estimating (col. 4, ln. 66 to col. 5, ln. 5, processor inherently includes memory for storing software instructions), and modifying the speech signal (processors 190, 200, and 210 of figure 1).

20. Claim 6 is rejected under 35 U.S.C. 103(a) as being unpatentable over Kleijn et al. (US Patent No. 6223151) in view of Donovan et al. (US Patent No. 6266637).

21. Regarding claim 6, Kleijn et al. fail to disclose that a pitch scaling algorithm such as Time Domain Pitch Synchronous Overlap-Add (TD-PSOLA) is used to normalize the pitch cycle lengths in an analysis frame. However, Donovan et al. teach that a pitch scaling algorithm such as Time Domain Pitch Synchronous Overlap-Add (TD-PSOLA) is used to normalize the pitch cycle lengths in an analysis frame (col. 4, ln. 1-25). The advantage of using the teaching of Donovan et al. in Kleijn et al. is to minimize signal degradation so to preserve characteristics of the original signal.

Since Kleijn et al. and Donovan et al. are analogous art because they are from the same field of endeavors, it would have been obvious to one of ordinary skill in the art at the time of invention to modify Kleijn et al. by incorporating the teaching of Donovan et al. in order to minimize signal degradation so to preserve characteristics of the original signal.

Conclusion

Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not

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mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

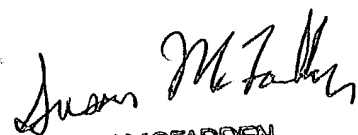
Any inquiry concerning this communication or earlier communications from the examiner should be directed to Huyen Vo whose telephone number is 703-305-8665. The examiner can normally be reached on M-F, 9-5:30.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Doris To can be reached on 703-305-4827. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Examiner Huyen X. Vo

September 22, 2004


SUSAN MCFADDEN
PRIMARY EXAMINER